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**Determinants Of Peanut Paste Eating Frequency In Urban Ghana: Does Household Members' Preference Matter?**

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## **Determinants of Peanut Paste Eating Frequency in Urban Ghana: Does Household Members' Preference Matter?**

Key words: peer effects, ordered probit model, peanut consumption

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## **Introduction**

Peanut is an important source of protein and fat in developing countries (Awuah et al., 2009), and it plays an essential role in the diet of most African countries, especially Ghana (Tsigbey et al., 2003; Jolly et al., 2008). According to Jolly et al's study in 2008, about 80 percent of Ghanaians reported to eat peanuts or peanut products at least once a week. Numerous studies discussed the close association between peanut consumption and human health. Peanut is a vital source of vitamin E, niacin, foliate and magnesium protein (Griel et al., 2004). And consumption of peanuts could reduce the risk of cardiovascular disease, increase serum magnesium concentration, and provide protection against certain human cancers (Alper and Mattes, 2003; King et al., 2008; Kris-Etherton et al., 2008; Mattes et al., 2008). Results also suggest that consumption of peanuts lowers the total cholesterol and triacylglycerol concentration among Ghanaians (Lokko et al., 2007). Therefore, regular consumption of peanuts and peanut based products should be encouraged.

In Ghana, as in most other West African countries, peanut is often processed into a wide variety of forms, including roasted peanuts, boiled peanuts, peanut paste, peanut cake, and other forms. Roasted or boiled peanuts are often eaten as snacks, peanut paste is used in preparation of soup or on bread, and peanut cake is added in some local delicacies (Tsigbey et al., 2003). While among them, peanut paste is the most popular peanut product in Ghana (Jolly et al., 2008; Florkowski and Kalavalli, 2013). Although almost all the Ghanaian households eat peanut paste, little is known about peanut paste eating frequency and its determinants. The present study aims at identifying factors influencing the peanut paste eating frequency using a survey data set of Ghana in 2011 and quantifying their effects, when household members' food preference are taken into account.

Nowadays, peer effects, social media, and social networking play an increasingly prominent role in the economics (Manski, 2010; Hartmann et al., 2008), especially in food production and consumption in both developed and developing countries. Because

preadolescences or adolescences' eating habit is easily affected by their parents or friends (Scaglioni et al., 2008), it is not surprise to find that an enormous amount of studies targeting their peer effects research on the food consumption related to this particular consumer group (Birch & Fisher, 1998; Patrick & Nicklas, 2005; Fortin & Yazbeck, 2011). While evidence also suggests that adult's food consumption behavior is closed associated to peer effects as well (Lau et al., 1990; Buller et al., 1999; Gruber & Haldeman, 2009). However, there is a lack of study that assessed and measured the role of peer effects especially the household member food preference in determining food consumption related to adults. Therefore, objectives of this study are: (a) to investigate the peanut paste consumption frequency and its determinants; (b) to examine the role of household member's food preference in affecting eating habit among adults.

The present study found out that education level are significant related to peanut paste eating frequency. That is, respondents who received formal education eat peanut paste less frequently than respondents without formal education. Additionally, peanut paste eating frequency various by respondents' location, leaded by Tamale, followed by Takoradi, and then Accra. In addition, results of the study indicate that household member's food preference has a significant effect in influencing peanut paste eating frequency as well. To be more specific, the probabilities that respondents eating peanut paste daily increases by 5.8 percent and weekly increases by 11 percent, if their household members like peanuts.

Knowledge about profiles of peanut paste consumers is essential for food retailers to formulate market strategy and target specific consumer groups in order to promote their peanut products such as peanut paste. More importantly, this study helps policy makers to improve consumer's diet and nutrition by recognizing peer effects, especially the household members' effect in food consumption.

### **Conceptual framework**

The consumer's utility-maximization model is employed in the present study. An individual consumer maximizes his or her utility level by choosing the optimal eating

frequency of peanut paste and therefore the peanut paste consumption quantity. Here, the eating frequency is assumed to be proportional to the corresponding consumption quantity. Based on the classic consumer theory, food consumption is determined by income and food preference. For example, eating frequency of peanuts is expected to be associated with income level (Jolly et al., 2008), because higher income generally indicates larger purchasing power and higher food expenditure. While food preference usually can be captured by selected socioeconomic factors such as education and occupation (McDowell et al., 1997; Bittencourt et al., 2007; Jolly et al., 2008), as well as demographic factors such as age or marital status (Han et al., 1998; Ricciuto et al., 2006; Bittencourt et al., 2007; Quaye et al., 2009). In addition, because a large number of studies confirm the crucial role peer effects play in determining food consumption behavior (Fowler et al., 2008; Halliday et al., 2007), the present study also includes peer effects in terms of household member's food preference into the explanatory variables.

### **Data and Methodology**

The survey data collected in 2011 in three big cities (i.e., Accra, Takoradi, and Tamale) were employed in the study to explore the urban Ghanaians' eating behavior. The respondents were asked about their food consumption information including peanut paste eating frequency and household member's food preference, to share their personal characteristics including age, marital status, occupation, and income. Descriptions of the variables used in the development of the model are shown in Table 1A. After deleting incomplete records, 981 observations were used in the data analysis. In the present sample, 60 percent of respondents were from Accra (the capital of Ghana), 21 percent from Takoradi, and the remaining 19 percent from Tamale. The respondent's age was from 17 to 80 years old and the mean is 39.3 years of age. About 75.5 percent are married. Also, 63.9 percent of respondents were self-employed, 24.6 percent worked in government or civil department, and the remaining 12.5 percent were retired, students, or unemployed. About 85.9 percent of respondents received formal education. In the month preceding the survey, the recorded income ranged from 5 Ghanaian cedi to 8500 Ghanaian cedi with the mean of 650.5 Ghanaian cedi.

The respondents were asked about how often did they eat peanut paste, and the answers were grouped into four categories, namely less than monthly, monthly, weekly, and daily (1=less than monthly, 2=monthly (1-3 times a month), 3=weekly (1-4 times a week), 4=daily (5-6 times a week or more often)). The bigger number indicates more frequent peanut paste consumption. According to the data set, 13.4 percent of respondents report eating peanut paste daily, 48.3 percent weekly, 30.9 percent monthly, and the remaining 7.4 percent less than monthly.

The ordinal categorical variable of peanut paste eating frequency is the dependent variable. While the explanatory variables include socio-demographic characteristics, location, as well as dummy variable indicating whether household members liked roasted peanuts or not (1=yes, 0=no) to capture peer effects. First, the ordered probit model was employed to identify the socio-demographic factors closely related to the peanut paste consumption, and then the t-test was used to check whether the household members' preference had a statistically significant effect in peanut paste eating frequency. Second, marginal effects of significant variables were computed to measure the change of probability in each eating frequency category corresponding to one-unit change in the value of each explanatory variable.

In the Jolly et al.'s study (2008), peanut products eating frequency was divided into less than 3 times a week and 3 or more times a week two categories, and logistic regression was used in their data analysis. While the present study focuses on peanut paste consumption, groups the eating frequency into daily, weekly, monthly, and less than monthly four categories, and considers family member's food preference. Our study provides more comprehensive information about peanut products consumption especially peanut paste eating frequency among urban Ghanaian.

### **Peanut paste consumption in Ghana**

Peanut paste for soup preparation is the most popular peanut form consumed, and peanut paste consumption is led by the Northern Zone and slightly less in Southern Zone (Jolly et al., 2008). According to the present survey, about 97 percent of respondents eat peanut

paste, which reconfirms the essential role of peanut paste in the diet of Ghanaians. To be more specific, 13.4 percent of respondents report eating peanut paste daily, 48.3 percent weekly, 30.9 percent monthly, and the remaining 7.4 percent less than monthly. Table 1 summarized how often urban Ghanaians eat the peanut paste and related consumption formats. The popular eating forms of peanut paste are led by adding it into soup and then straightly on bread. Based on the frequency table, 87.2 percent of respondents said they ate peanut paste as an addition to soup often or very often, and 50.7 percent reported to spread peanut paste on bread often or very often, which is consistent with previous finding (Tsigbey et al., 2003; Jolly et al., 2008). Other eating forms related to peanut paste include adding into stews, on non-bread foods, and as a sauce, however, the corresponding frequencies are very low. Table 2 displays peanut paste eating frequency for the three big cities, and clearly in North region such as Tamale, respondents consume peanut paste more frequently than in South region such as Accra and Takoradi. It may be because the Northern Region produce more than 80 percent of the country's peanuts (Tsigbey et al., 2003). According to the peanut paste attribute rate table (Table 3), the most important attributes are taste, aroma and color, and followed by thickness, vitamins, and no oil separate. Meanwhile, about 37.2 percent of respondents said they make peanut paste at home, but not very often. And results indicate that respondents buy their peanut paste mainly from local markets.

## **Results**

Results from the ordered probit model estimation are showed in Table 4. It indicates that household members' food preference have a statistically significant influence in determining peanut paste eating frequency among urban Ghanaians. In addition, results also suggest that respondents' education level and location also closely associated with peanut paste consumption frequency. Marginal effects of the significant factors are computed and displayed in Table 5, in order to measure the change of probability related to certain peanut paste eating frequency corresponding to one-unit change of significant factors.

### *Peer effect*



The peer effect in terms of household members' food preference has a significant effect in determining peanut paste eating frequency. Results indicate that respondents having household members like roasted peanuts are found to consume peanut paste more often than respondents whose household members don't like roasted peanuts. In other words, respondents from a household where members like roasted peanuts are more likely to consume peanut paste frequently such as daily and weekly. And the probability premium is about 5.8 percent for eating peanut paste daily, and 11 percent for weekly. It reconfirms that eating habit such as food consumption frequency is affected by household member's food preference.

### *Education*

People with formal education ate peanut paste less often than respondents without formal education. More specifically, a formal education will decrease the probability of eating peanut paste daily by 8.3 percent, and weekly by 5.9 percent, while increase the likelihood of consuming peanut paste monthly by 10.7 percent, less often than monthly by 3.4 percent. This finding is different from previous finding in Bulgaria, where Moon et al. (1999) found that consumers with more education tended to consume more roasted peanuts. It may be because educated consumers are more concern about food quality, while in Africa aflatoxin contamination is often related with peanut products, especially related to peanut paste (Florkowski and Kolavalli, 2013).

### *Location*

Consumers in both Tamale and Takoradi had a higher probability of eating peanut paste weekly or daily than consumers in Accra, Ghana's capital. Tamale consumers are 27.1 percent more likely to eat peanut paste daily than Accra consumers, and 6.7 percent more likely to consume peanut paste weekly. Despite the magnitude between consumers in Takoradi and Accra is small, but the difference is still significant, namely, Tamoradi respondents are 3.3 percent more likely to eat peanut paste weekly and daily than Accra respondents. It is consistent with previous study that location has a significant effect in determining peanut products (Moon et al., 1999), and reconfirm that consumers in Northern Ghana eat more peanut products (Jolly et al., 2008).

## **Conclusion**

The close association between peanut products consumption and human health has been well documented, and peanut products especially peanut paste plays an active role in urban Ghanaians' diet. Despite an increasing number of evidence illustrate that nowadays peer effects are of great importance to food production and food consumption, very few study investigates and measures the role of peer effects in affecting food consumption.

Using a survey data set collected in 2013, the present study provides a robust picture of the determinants of peanut paste eating frequency in Ghana's urban area. Because household member's food preference is found to be a crucial factor in determining the eating behavior and food consumption. Results suggest that in order to increase peanut paste consumption or other similar healthy foods, policy that targets on households instead of individuals would be more effective in encouraging consumption of the particular desired food items.

Regional difference is still a major driver behind the peanut products consumption. Since results of the study indicate in Northern Region of Ghana such as Tamale, consumers eat peanut paste much more frequently than South part of Ghana. Food retailers may need to focus their peanut products promotion especially peanut paste to the Northern Region of Ghana. In addition, in order to attract formal educated consumers, food producers and processors need to enhance their food quality to meet well-educated consumer's specific need.

## **Reference**

- Alper, C. M., & Mattes, R. D. (2003). Peanut consumption improves indices of cardiovascular disease risk in healthy adults. *Journal of the American College of Nutrition*, 22(2), 133-141.
- Awuah, R., Fialor, S., Binns, A., Kagochi, J., & Jolly, C. (2009). Factors Influencing Market Participants Decision to Sort Groundnuts along the Marketing Chain in Ghana. *Peanut Science*, 36: 68-76.

- Bittencourt, M. V. L., Teratanavat, R. P., & Chern, W. S. (2007). Food consumption and demographics in Japan: Implications for an aging population. *Agribusiness*, 23(4), 529-551.
- Birch, L. L., & Fisher, J. O. (1998). Development of eating behaviors among children and adolescents. *Pediatrics*, 101(Supplement 2), 539-549.
- Buller, D. B., Morrill, C., Taren, D., Aickin, M., Sennott-Miller, L., Buller, M. K., Larkey, L., Alatorre, C., Wentzel, T. M. (1999). Randomized trial testing the effect of peer education at increasing fruit and vegetable intake. *Journal of the National Cancer Institute*, 91(17), 1491-1500.
- Fowler, J. H., & Christakis, N. A. (2008). Estimating peer effects on health in social networks: A response to Cohen-Cole and Fletcher; Trogdon, Nonnemaker, Pais. *Journal of health economics*, 27(5), 1400.
- Florkowski, W. J., & Kolavalli, S. Aflatoxin control strategies in the groundnut value chain in Ghana. IFPRI Ghana Strategy Support Program Working Paper, 33.
- Fortin, B., & Yazbeck, M. (2011). Peer effects, fast food consumption and adolescent weight gain. CIRANO-Scientific Publications 2011s-20.
- Griel, A. E., Eissenstat, B., Juturu, V., Hsieh, G., & Kris-Etherton, P. M. (2004). Improved diet quality with peanut consumption. *Journal of the American College of Nutrition*, 23(6), 660-668.
- Gruber, K. J., & Haldeman, L. A. (2009). Peer Reviewed: Using the Family to Combat Childhood and Adult Obesity. *Preventing chronic disease*, 6(3).
- Hartmann, W. R., Manchanda, P., Nair, H., Bothner, M., Dodds, P., Godes, D., Hosanagar, K., and Tucker, C. (2008). Modeling social interactions: Identification, empirical methods and policy implications. *Marketing Letters*, 19(3-4), 287-304.
- Halliday, T. J., & Kwak, S. (2009). Weight gain in adolescents and their peers. *Economics & Human Biology*, 7(2), 181-190.
- Han, T., & Wahl, T. I. (1998). China's rural household demand for fruit and vegetables. *Journal of Agricultural and Applied Economics*, 30, 141-150.

- Lau, R. R., Quadrel, M. J., & Hartman, K. A. (1990). Development and change of young adults' preventive health beliefs and behavior: influence from parents and peers. *Journal of health and social behavior*, 240-259.
- Jolly, C. M., Awuah, R. T., Fialor, S. C., Agyemang, K. O., Kagochi, J. M., & Binns, A. D. (2008). Groundnut consumption frequency in Ghana. *International Journal of Consumer Studies*, 32(6), 675-686.
- King, J. C., Blumberg, J., Ingwersen, L., Jenab, M., & Tucker, K. L. (2008). Tree nuts and peanuts as components of a healthy diet. *The Journal of nutrition*, 138(9), 1736S-1740S.
- Kris-Etherton, P. M., Hu, F. B., Ros, E., & Sabaté, J. (2008). The role of tree nuts and peanuts in the prevention of coronary heart disease: multiple potential mechanisms. *The Journal of nutrition*, 138(9), 1746S-1751S.
- Lokko, P., Lartey, A., Armar-Klemesu, M., & Mattes, R. D. (2007). Regular peanut consumption improves plasma lipid levels in healthy Ghanaians. *International Journal of Food Sciences and Nutrition*, 58(3), 190-200.
- Manski, C. 2010. Economic Analysis of Social Interactions. *The Journal of Economic Perspectives*, 14(3): 115-136.
- Mattes, R. D., Kris-Etherton, P. M., & Foster, G. D. (2008). Impact of peanuts and tree nuts on body weight and healthy weight loss in adults. *The Journal of nutrition*, 138(9), 1741S-1745S.
- McDowell, D. R., Allen-Smith, J. E., & McLean-Meyinsse, P. E. (1997). Food expenditures and socioeconomic characteristics: focus on income class. *American journal of agricultural economics*, 79(5), 1444-1451.
- Moon, W., Florkowski, W. J., Beuchat, L. R., Resurreccion, A. V., Chinnan, M. S., Paraskova, P., & Jordanov, J. (1999). Effects of product attributes and consumer characteristics on attitude and behavior: The case of peanuts in a transition economy. *Agribusiness*, 15(3), 411-425.
- Patrick, H., & Nicklas, T. A. (2005). A review of family and social determinants of children's eating patterns and diet quality. *Journal of the American College of Nutrition*, 24(2), 83-92.
- Quaye, W., Gyasi, O., Larweh, P., Johnson, P. N. T., & Obeng-Aseidu, P. (2009). The

- extent of marketability and consumer preferences for traditional leafy vegetables—a case study at selected markets in Ghana. *International Journal of Consumer Studies*, 33(3), 244-249.
- Ricciuto, L., Tarasuk, V., & Yatchew, A. (2006). Socio-demographic influences on food purchasing among Canadian households. *European Journal of Clinical Nutrition*, 60(6), 778-790.
- Scaglioni, S., Salvioni, M., & Galimberti, C. (2008). Influence of parental attitudes in the development of children eating behaviour. *British Journal of Nutrition*, 99(S1), S22-S25.
- Tsigbey, F., Brandenburg, R., & Clottey, V. (2003). Peanut production methods in Northern Ghana and some disease perspectives. *World Geography of Peanut*. USAID Peanut CRSP. Web page: <http://www.lanra.uga.edu/peanut/knowledgebase/tsigbey1.cfm>.

**Table 1:** Eating forms of peanut paste in urban Ghana.

Form	Almost never (%)	Seldom (%)	Often (%)	Very often (%)
As an addition to a sauce	71.5	19.4	6.7	2.6
As an addition to soups	2.1	10.8	45.1	42.1
As an addition to stews	66.4	16.5	11.8	5.2
On bread	24.7	24.6	34.5	16.2
As an addition to non-bread food	63.2	22.4	9.5	5.0

**Table 2:** Peanut paste eating frequency by location.

Eating frequency	Tamale (%)	Accra (%)	Takoradi (%)
Daily	38.7	5.8	9.8
Weekly	53.3	45.9	49.8
Monthly	7.5	38.7	32.4
Less than monthly	0.5	9.6	8.0

**Table 3:** Peanut paste attribute.

Attribute	Not important at all (%)	Not important (%)	Neutral (%)	Important (%)	Very important (%)
Color	2.7	6.2	7.3	53.4	30.4
Aroma	1.2	5.9	9.4	51.8	31.7
Thickness	1.8	8.5	16.8	46.7	26.2
Taste	0.5	3.3	5.0	46.9	44.3
No oil separate from the rest of paste	6.0	17.5	21.2	39.5	15.8
Crunchy	9.1	29.4	28.8	26.7	6.0
Vitamin A	1.2	6.9	20.1	49.2	22.6
Other vitamins	1.0	6.3	18.8	48.3	25.6

**Table 4.** Estimation results of the peanut paste eating frequency in urban households of Ghana, 2011.

<b>Variable name</b>	<b>Coefficient</b>	<b>Standard error</b>
	Peer effect factor	
Memberlike	0.431***	0.128
	Demographic factors	
Married	.034	.084
Age	-.005	.003
	Socioeconomic factors	
Income	-8.870e-06	0.048e-03
Employ_self	-0.181	0.116
Employ_gov	0.056	0.132
Educ_formal	-0.406***	0.119
	Location	
Tamale	1.090***	0.114
Takoradi	0.183**	0.093
Cut1	-1.594	0.262
Cut2	-0.330	0.258
Cut3	1.334	0.261

Note: \*, \*\* and \*\*\* denote significant at 10%, 5%, and 1% levels, respectively.

**Table 5.** Marginal effect in peanut eating frequency.

<b>Variable name/ dy/dx</b>	<b>Less often than monthly</b>	<b>Monthly</b>	<b>Weekly</b>	<b>Daily</b>
Memberlike*	-0.061 (0.023)	-0.106 (0.029)	0.110 (0.038)	0.058 (0.014)
Educ_formal*	0.034 (0.008)	0.107 (0.031)	-0.059 (0.012)	-0.083 (0.029)
Tamale*	-0.072 (0.009)	-0.260 (0.023)	0.061 (0.020)	0.271 (0.037)
Takoradi*	-0.018 (0.009)	-0.049 (0.025)	0.033 (0.015)	0.033 (0.018)

Note: This table only reports the results at 10% levels. Standard errors are in parentheses.

(\*) dy/dx is for discrete change of dummy variable.



**Table 1A.** Descriptive statistics of variables included in the empirical model.

<b>Variable name</b>	<b>Variable description / units of measurement</b>	<b>Mean</b>	<b>Std dev</b>
Dependent variable:			
Fre_peanutpaste	How often do you eat peanut paste? Less often than monthly=1; monthly=2; weekly=3; daily=4	2.672	0.787
Independent variables:			
Memberlike	Peer effect factor =1 if members of respondent's household like roasted peanuts	0.916	0.277
Married	Demographic factors =1 if a respondent is married	0.755	0.430
Age	Actual age in years	39.256	10.650
Income	Socio-economic factors Household income in the month preceding the survey / in Ghanaian cedis	650.519	793.532
Employ_self	=1 if a respondent is self-employed	0.639	0.480
Employ_gov	=1 if a respondent is gov/civil employee	0.246	0.429
Educ_formal	=1 if a respondent has a formal education (Junior high school/middle School and higher education)	0.859	0.348
Tamale	Location =1 if a household is in Tamale	0.190	0.392
Takoradi	=1 if a household is in Takoradi	0.210	0.408